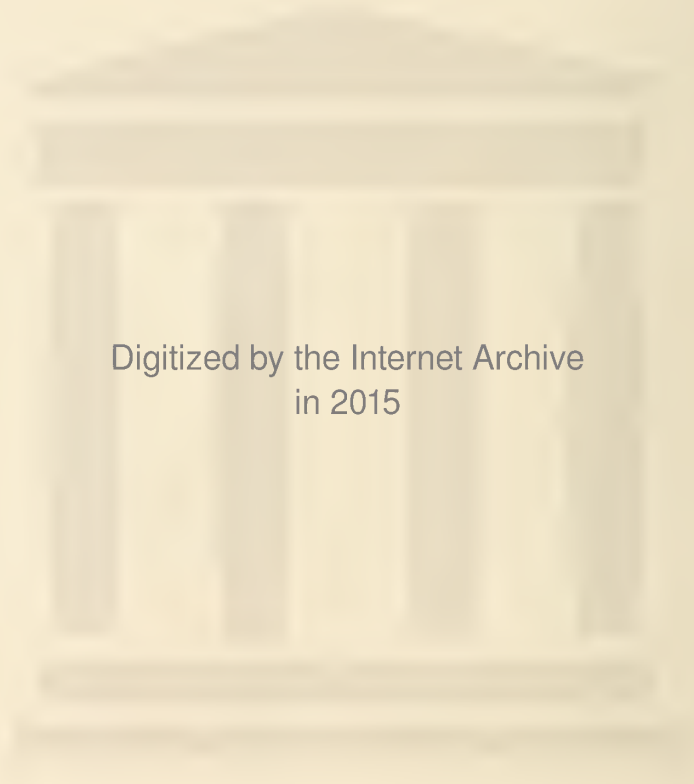
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REPORT

ON

FRACTURES.

BY

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REPORT ON FRACTURES.

THERE is such a difference of opinion in the profession in regard to the proper treatment of fractures, and also as to the prognosis in such accidents, that it seems to me a proper subject to bring before the Association for discussion, and see if, with the advantages we now have of anæsthetics, and also the numerous methods that have lately been adopted of retaining the bones in position, we cannot settle upon some fixed plan of treatment, that shall be of universal application, and that shall give better average results than heretofore we have been taught to consider as satisfactory.

When I was a student we were taught that as the bones did not commence to unite until after the ninth day, there was no absolute necessity to have them accurately adjusted until after this period. That all that was necessary during these nine days was to support the fractured limb on pillows in as good a position as was convenient, to make the patient in this way as comfortable as possible, and to combat inflammation with evaporating lotions, etc. etc., and to wait until the inflammation and swelling of the soft parts around the seat of fracture had subsided before we "set" the bone.

This was the universal practice at the New York Hospital at that time, and of all the physicians with whom I was acquainted. I am sorry to say that I have heard of two cases treated in this way in this city, within the past few months, and by gentlemen of position in the profession.

The first case of fracture that I saw after commencing practice early taught me the error of this doctrine, and I have never followed it since. I now always adjust a fracture as soon as I see it (if it is possible to do so), whether it be simple, compound, comminuted, or complicated, and then try to keep it in position, if

possible. Of course I do not include in this statement cases in which amputation is the only remedy.

As the result of my experience I would lay it down as a rule, that it is our duty to replace and accurately adjust all cases of fracture, which do not require amputation, *immediately* after the occurrence of the fracture, or as soon as we are called to see it, whether it be one hour or two days after the accident. If it is replaced *immediately* after the accident, the swelling of the soft parts will not take place to the same extent as when left distorted, and in many cases that I have seen, no swelling at all has occurred.

The bones are merely the framework to keep the body in shape and form. Each man's bones, whether tall or short, have muscles, bloodvessels, nerves, and connecting tissues perfectly to correspond, if he is not deformed. When the bone is fractured, the muscles traversing the fractured spot, by their contraction, produce shortening and distortion. By the contraction of the muscles the bloodvessels are necessarily looped in folds or zigzagged, thereby preventing free circulation through them.

Arteries having the *vis à tergo* from the heart's contraction, together with the contractility of their own muscular coat, may have power to force the blood through these obstructed channels to the portions of the limb beyond the fracture; but the veins, which are deprived of this propelling power, cannot return the blood through these angular distortions. Hence the œdema and effusion into the cellular tissue surrounding fractured bones that have not been immediately replaced in their normal position. Consequently the truth of my first remark, as to the necessity of immediate reduction of the fractures, must be apparent.

The evidences of fracture, as taught by all authorities, such as shortening, deformity, false point of motion, crepitus, etc., are so well established as to require no discussion.

The method of reduction and the time when it should be done, being moot questions, are deserving of consideration.

In fractures of the cranium, the plan of treatment is so well established as to require no additional amplification.

In fractures of the spine, reclining in a horizontal posture and a state of total rest, upon an air or water bed (air bed being preferable), with some fixed apparatus, such as plaster of Paris, dextrine, the silicates, celluloid, albumen and flour, etc., to prevent possibility of motion, is all that is requisite.

For fractures of the upper and lower jaw, the plan of treatment and mechanical contrivances employed by Dr. N. Kingsley, dental surgeon, preclude the necessity of further amplification.

In cases of fractured ribs, a broad band of adhesive plaster or bandage around the body, to hold the parts steady, is all that is necessary.

Fractures of the long bones require that *extension* and *counter-extension, under the influence of chloroform* or other anæsthetic, if necessary, should be made in a *proper direction*, until perfect accuracy of adjustment is obtained, and after this, *retention* and *fixation in this normal condition* until *consolidation.*

By *accuracy of adjustment* I mean the perfectly normal condition of the bone as to length and position. When the extension and counter-extension have been properly made, the muscles and other tissues surrounding the bones will necessarily and positively force the fractured extremities into their natural position, as above described, unless some foreign body, as a shred of muscle or connective tissue, has got between the fragments.

All extension beyond this point of perfect accuracy of adjustment is unnecessary and injurious; for, being abnormal, it excites reflex contractions. Hence the objection to continued extension which keeps up reflex irritation, or else by paralyzing the muscles allows of elongation, and consequently, frequently results in non-union.

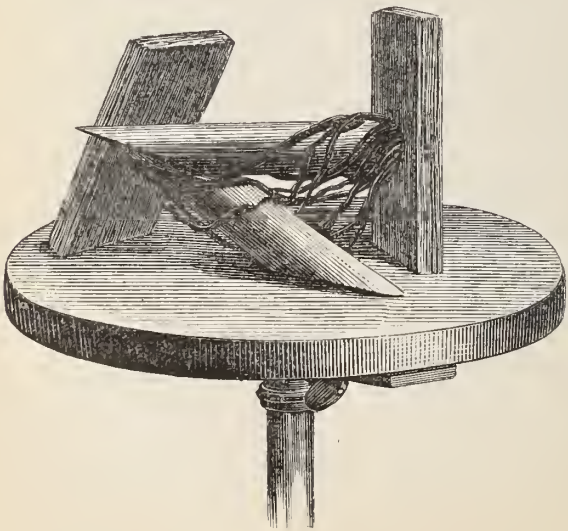
All extension short of that necessary to this perfect adjustment is insufficient, leaving the extremities of the bone as sources of irritation, and causing pain and muscular contractions as well as leaving the vessels in a looped position, causing the œdema heretofore described. The nerves, also, being in an abnormal position, are additional sources of irritation.

When the bone (whatever bone it may be) is thus placed and retained in its normal position, the patient is free from pain, and all the functions of the limb are as well performed, in cases of simple fracture, and the recovery, in a healthy constitution, will be as perfect and complete, with normal length, without deformity, as if no fracture had occurred. If the limb has been extended to its normal length, the bones must necessarily be accurately adjusted by the surrounding tissues. If this position, therefore, be positively maintained, shortening cannot by any means take place, but rather a lengthening to the extent of the

plastic material effused between the bones that joins the fractured extremities.

To illustrate the practical applications of the principle I am trying to inculcate, I have made this little model of three round sticks of exactly equal length. One of these sticks is nailed or screwed fast at each end, and to the middle of a small board four or six inches square, and is intended to represent the femur, or any other long bone. Small holes are then bored through these boards closely surrounding each end of the sticks, and as closely together as possible. Then thread a bodkin or eyed probe with some yards of elastic rubber or Indian-rubber tape to represent the muscles, and draw it through these holes in each board, closely surrounding the stick. Of course this is a very imperfect representation of the natural condition of a bone, and its surroundings, as in the normal state there is no vacant space whatever; but still it will answer practically to represent the muscles, and of course if the connective tissue could also be supplied, the illustration would be so much the better, and if the experiment answers in this rude model, it should, of course, act much more perfectly in the human subject.

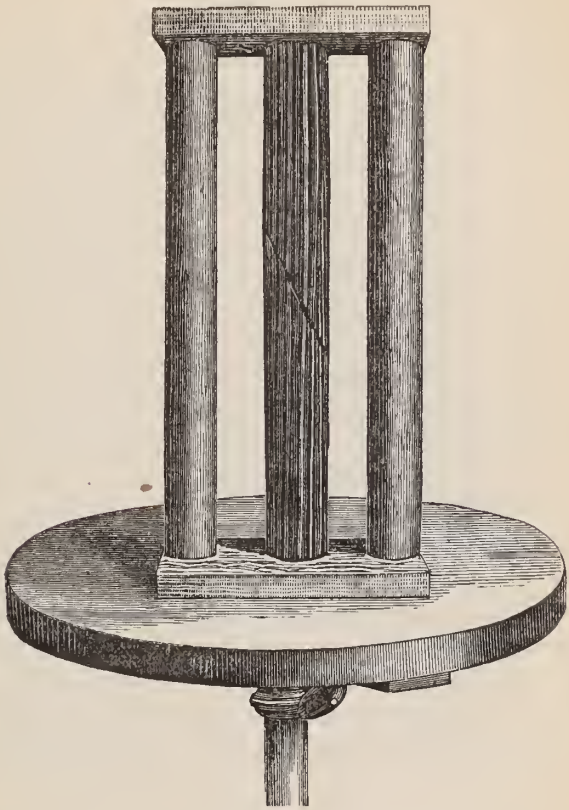
Fig. 1.



This stick, which is to represent the bone, is now sawed in two pieces in the middle at a very oblique angle, to represent an oblique fracture. The rubber muscles will instantly contract,

protruding the sharp ends of the stick in different directions, and looping the vessels and nerves in a zigzag position, as seen in Fig. 1, from photograph of the model by Mason, of Bellevue Hospital.

Fig. 2.



Now by taking hold of the boards, and by pulling in the right direction until an assistant can place the two other sticks on either side of the sawed one, it will be found that the rubber muscles have accurately adjusted the sawed fragments, as seen in Fig. 2 (from photograph by Mason), and, if no further extension is made, will keep the fragments in accurate apposition so long as the side-sticks are retained in place. These two sticks having been sawed of exactly the same length as the one representing the fractured bone, will, when placed between the boards, stretch the Indian-rubber muscles to *exactly* the length of the sawed stick, *and no further*, and it will be found that the adjustment of the

fracture in the sticks is perfect and accurate, and all that is required is to keep them there, and the fractured stick will retain its position so long as they are not disturbed. If you continue to make extension beyond this point which is necessary for accuracy of adjustment, you will separate the fragments, and thus represent *the effects* of *continued extension* in the treatment of fractures.

The plan that has here been briefly sketched, I believe to be of universal application, and the surgeon who can the most accurately put it into actual practice will have the best results in the treatment of fractures. In a report of this nature, which is simply intended to bring up the subject for discussion, it would be altogether out of place to go into the details of the treatment of fractures of each different bone, as it would make a paper altogether too voluminous for publication in the Transactions of the Association. But I will simply supplement it by a table of the fractures treated in Bellevue Hospital in the year 1873, which has been compiled from the hospital records by Dr. Van Wagenen, late house surgeon to Bellevue Hospital.

It will be particularly observed in studying these tables that the three cases of greatest shortening, in which the permanent dressing of plaster of Paris was applied, were the three cases that were necessarily confined to their bed on account of other complications, showing that if this dressing is the one preferred by the surgeon, it is better to keep his patient up and walking about occasionally, as the limb will then fill with blood and retain its accuracy of fit to the plaster casing, whereas the horizontal posture allows of more shrinkage, and the extension not being accurately retained necessitates the more frequent change of the dressings.

A RECORD OF FRACTURES TREATED AT BELLEVUE HOSPITAL WITH PLASTER PARIS APPARATUS,

From April 1, 1872, *to April* 1, 1873,

INCLUDING ONLY THOSE CASES OF WHICH A THOROUGH RECORD COULD BE FOUND

TABULATED BY

GEO. A. VAN WAGENEN, M.D.,

House-Surgeon, Bellevue Hospital, October, 1872—April, 1873.

The record of fracture of femur is full, including almost all the cases treated, while the record of results in less important cases (as fractures of the leg) has been neglected in many instances. Many were simply marked "*cured*," with no statement as to time, number of splints, and condition of the limb after treatment, etc. *These were all* REJECTED in the inclosed tables.

G. A. V. W.

SIMPLE FRACTURES

Name.	Sex.	Age.	Date.	Bone.	Point.	Shortening, deformity, etc.	Cause of injury.
Ed. Gurner.....	M.	3½	June 20	Femur	Junction mid. & lower third	Transverse, short 1 inch	Fall down stairs
Robert Tracy.....	M.	7	Nov. 2	"	Just below troch. major	¾ inch short	Fall against curb
N. Brown.....	M.	9	Feb. 10	"	Junction up. & mid. third	1½ inch short	Struck by car
T. McC.....	M.	10	Aug. 31	"	Junction up. & mid. third	1¾ inch short	Fall of three stories
Fr. McCahe.....	M.	15	Nov. 17	"	Middle third	1¾ inch short	Pile of lumber fell on him
Mary Keenan.....	F	16	Jan. 11	"	2 inches above knee	Crepitus and false motion; no deformity; no shorten'ng	Fall 10 feet
M. O'Hara.....	M.	19	Mar. 29	"	Middle third	1½ inch short	Fell 3 stories
H. L.....	M.	23	Aug. 10	"	Middle shaft	.....	.....
M. Delaney.....	M.	26	Feb. 17	"	Middle shaft	.....	Fall 30 feet
Thos. Sullivan	M.	26	Mar. 15	"	Lower third	1½ inch short	.....
J. McIlvain.....	M.	26	June 16	"	Middle shaft	.....	Fall 30 feet
M. Stewart.....	F.	29	June 21	"	Middle third	.....	Fall 4 stories
S. Knapp.....	M.	35	Oct. 11	"	Just below troch. major	Great swell'g, ⅞ inch short	Fall 6 feet
Pat. Mergan	M.	37	Feb. 18	"	Middle shaft	⅞ inch short	Fall 20 feet
Fred. Norman.....	M.	43	June 3	"	Junction middle and lower third	2 inches short, and lateral deformity.	Fall 10 feet
J. McCann	M.	43	March 30	"	3 inches above condyles	1 inch short, great swelling	Kick of horse
Jos. Shannon.....	M.	45	Dec. 17	"	Middle third	1 inch short	Fall on ground
J. Williamson.....	M.	45	June 26	"	Junction mid. & upper third	.....	Run over by truck
J. W.....	M.	44	Aug. 28	"	Upper third	.....	.....
Jas. Hall.....	M.	46	Aug. 10	"	Junction mid. & lower third	2 inches short	Case of goods fell on him
Jas. McGovern....	M	54	Aug. 24	"	Middle third	1½ inch short	Run over by wagon
R. Yohr.....	M.	56	March 3	"	Upper third	½ inch short, lat. deformity	Fall down stairs
Ann Karty.....	F.	60	Dec. 23	"	Intracapsul.	1 inch short	Fall on ground
P. D.....	M.	60	Dec. 6	"	Neck, extra-capsul.	1¼ inch short	Struck by wagon

OF OS FEMORIS.

Splints. Applied. 1st.	Applied. 2d.	Applied. 3d.	Removed. 1st.	Removed. 2d.	Removed. 3d.	Number of splints.	Result.	Anæsthetic.	Remarks.
June 23 3d day	.....	.....	July 22 29 days	.....	.....	1	¼ in. short	None	
Nov. 7 5th day	.....	.....	Dec. 14 35 days	.....	.....	1	No shortening	Ether	
Feb. 25 15th d'y	.....	.....	Mar. 23 28 days	.....	.....	1	¾ in. short; firm union	None	Buck's extension was used until Feb. 25 (first 15 days).
Sept. 1 2d day	.....	.....	Oct. 10 40 days	.....	.....	1	¾ inch short	Ether	
Nov. 19 2d day	.....	.....	Jan. 7 48 days	.....	.....	1	⅛ inch short	Ether	
Jan. 25 14th d'y	Feb. 17	.....	Feb. 17 22 days	Mar. 10 23 days	.....	2	No shortening; good union, etc.	None	
April 4 5th day	.....	.....	May 12 38 days	.....	.....	1	¾ in. shortening; good union, etc.	None	
Aug. 12 2d day	.....	.....	Sept. 26 44 days	.....	.....	1	No shortening	Ether	
Feb. 21 4th day	Mar. 5	.....	March 5 12 days	April 2 27 days	.....	2	1½ inch short; slight bowing outward	Ether both times	Buck's extension for first 3 days. This patient had pneumonia, and remained in bed all the time during treatment.
April 2 18th d'y	.....	.....	May 14 42 days	.....	.....	1	¾ inch shortening; union firm	None	Buck's extension had been used for 18 days; shortening still 1½ in. This was reduced by pulleys to ¾ inch, and plaster applied.
June 23 7th day	.....	.....	Aug. 5 42 days	.....	.....	1	½ in. shortening	None	This patient also had dislocation of opposite femur into sciatic notch, delaying the application of plaster to fractured limb.
June 24 3d day	.....	.....	July 19 25 days	.....	.....	1	½ in. shortening	Ether	Removed early on account of a bed-sore (25th day).
Oct. 23 11th d'y	.....	.....	Dec. 4 41 days	.....	.....	1	½ in. shortening		Buck's extension for 11 days until swelling subsided.
Feb. 20 2d day	.....	.....	April 4 44 days	.....	.....	1	¼ in. shortening; union and position good		
June 4 n'xt d'y	.....	.....	July 13 39 days	.....	.....	1	½ in. shorteuing		
Mar. 30 1 h. aft'r injury	.....	.....	May 13 43 days	.....	.....	1	¼ in. short'ning; position and union perfect	Ether	
Dec. 20 3d day	.....	.....	Jan. 31 41 days	.....	.....	1	1⅛ inch shortening	.....	Delirium tremens came on Dec. 18, before the splint was applied
July 1 5th day	July 17	.....	July 17 16 days	No record — days	.....	2	Ununited	Ether both times	A leather splint was arranged for him, and he was able to *walk* aided by a crutch. The first splint was loose when removed.
Aug. 30 2d day	.....	.....	Sept. 8 9 days	.....	.....	1	¾ in. shortening	Ether	The splint excoriated perineum and was removed, Buck's extension being applied.
Aug. 14 4th day	Aug. 17	.....	Aug. 17 3 days	Oct. 1 43 days	.....	2	½ in. shortening	Ether	
Aug. 24 same day	.....	.....	Oct. 7 43 days	.....	.....	1	¼ in short'ning; slight stiffness at knee	Ether	
May 8 5th day	.....	.....	June 3 25 days	.....	.....	1	2 inches shortening	Ether	Patient had subacute pleurisy, and was kept in bed during treatment. He lost flesh, and the splint became very loose.
Feb. 11 47th d'y	.....	.....	Feb. 28 17 days	.....	.....	1	1 in. sht. (same) but she now walks	.....	This was applied simply to allow her to go about with a crutch.
Dec. 10 4th day	.....	.....	Feb. 1 50 days	.....	.....	1	¼ in short'ning; union and position right	None Pat'nt had card'c	

SIMPLE FRACTURES

Name.	Sex.	Age.	Date.	Bone.	Point.	Shortening, deformity, etc.	Cause of injury.
P. K.	M.	65	Nov. 6	Femur	Neck, extra-capsul.	.....	.....
Wm. Flood	M.	65	Dec. 2	"	Intracapsul.	¾ inch short	Fall on ground
Tim. Flynn	M.	74	Sept. 28	"	Through troch. major	2 inches short	Fall 20 feet

COMPOUND FRACTURES

Charles Reginstein	M.	8	Sept. 19	Femur, comp'd	Upper third	.....	Run over hy truck

COMPLICATED FRACTURES

Herbert Putnam...	M.	19	July 4	Femur, Tibia, comp. com.	Lower part of middle third	.....	Crushed between 2 railroad cars in a railroad accident
Charles Burns.....	M.	33	July 23	Femur, Tibia and Fibula, simp.	Middle Middle	.....	Run over hy truck
Alice Delaney.....	F.	17	June 15	Femur, Humerus, simple	Lower third Middle third	.....	Struck hy rocks from a blast
S. U. Clerk.....	M.	18	Jan. 21	Femur, Humerus, simple	Oblique just about middle, just above condyles	Oblique, 1 inch short 1 inch short, oblique	Fall 30 feet

RESULTS.

Lengthening of ⅛ inch.	No. 1.	
No shortening	" 4.	
Shortening of ⅛ inch.	" 4.	
Shortening of ¼ inch.	" 5.	
Shortening of ½ inch.	" 7.	
Shortening of ⅔ inch.	" 1.	
Shortening of ¾ inch.	" 5.	See cases for reasons for this poor result.
Shortening of 1 inch.	" 1.	Treatment began late; no attempt to get full length.
Shortening of 1¼ inch.	" 1.	Patient had a bad attack of delirium tremens.
Shortening of 1½ inch.	" 1.	Patient had a bad pneumonia; in bed all the time (the *worst possible* position in plaster thigh dressings).
Shortening of 2 inches.	" 1.	Kept in bed by subacute pleurisy.
Ununited.	" 1.	

OF OS FEMORIS.—Continued.

Splints. Applied. 1st.	Applied. 2d.	Applied. 3d.	Removed. 1st.	Removed. 2d.	Removed. 3d.	Number of splints.	Result.	Anæsthetic.	Remarks.
Nov. 12 6th day	.....	.....	Jan. 12 69 days	.....	.....	1	½ in. shortening	None	
Dec 4 2d day	.....	.....	Dec. 19 15 days	.....	.....	1	½ in. shortening	Ether	
Oct 8 10th d'y	.....	.....	Nov 16 38 days	.....	.....	1	¼ in. short'ning; union, etc., perfect	.....	Patient had pneumonia after plaster was applied, and was kept in bed 12 days.

OF OS FEMORIS.

Sept. 18 9th day	.....	.....	Oct. 16 28 days	.....	.....	1	¼ in. short'ning; union and position perfect	None	The wound was sealed with collodion on muslin, and patient kept in bed with Buck's extension and coaptation splints on. Plaster not applied immediately for fear of doing injury to the limb in the struggle he would probably make.

OF OS FEMORIS.

July 4 5½ hours after injury	July 17	.....	July 17 13 days	Aug. 21 34 days	.....	2 1 leg	⅛ in. lengthening	Ether both times	A splint was first put on the fractured leg, from this extension was made to bring down the femur. Next day leg splint was cut off to the knee and a new one put on to be sure that extension had done no harm to leg.
July 24 P. M. n'xt d'y	.....	Sept. 4 (4th) Oct. 3	Sept. 4 July 25	..... Sept. 4	Oct. 3 (4th) no record	1 4 leg	No shortening; absolute	Ether	The splints were arranged for extension as in the case above.
July 24 A. M.	July 25								
June 17 2d day June 18 3d day	July 7	.....	July 7 20 days July 15 28 days	July 25	.....	2 1 arm	⅛ in. short'ning; position and union perfect	Ether both times	
Jan. 24 3d day Jan. 24 3d day	Feb. 5	.....	Jan. 28 4 days Mar. 11 47 days	Feb. 27 22 days	.....	2 1	⅔ in. short.; position, etc., perfect	Ether	

RESULTS.

Lengthening is 1, or $\frac{1}{30}$ about of all cases.

No shortening are 5, or $\frac{1}{6}$ about of all cases.

Shortening of ⅛ inch and less are 9, or $\frac{1}{3}$ " " " or $\frac{9}{31}$.

Shortening of ¼ inch and less are 14, or ½ " " " or $\frac{14}{31}$.

Shortening of ½ inch and less are 21, or $\frac{2}{3}$ " " " or $\frac{21}{31}$.

Shortening of 1 inch and less are 27 or $\frac{9}{10}$ " " "

Shortening of over 1 inch are 3 or $\frac{1}{10}$ " " " See cases for reasons.

SIMPLE FRACTURES

Name.	Sex.	Age.	Date.	Bone.	Point.	Shortening, deformity, etc.	Cause of injury.
Nora Rowan.....	F.	19	July 8	Patella	.....	¾ inch separation	Fall
Nora Rowan..... (Refracture)	F.	19	Sept. 22	"	.....	Considerable separation	Fall
D. Garry.....	M.	24	Jan. 26	"	Transverse	Widely separated	Muscular contraction in attempting to catch himself
Fred. Bebring.....	M.	30	Feb. 8	"	"	¾ inch separation	Muscular traction in attempting to catch himself
Anton. Joseph	M.	35	Dec. 24	"	"	1 inch separation	.....
David Lynch	M.	36	Dec. 19	"	"	¾ inch separation	Fall

COMPOUND FRACTURES

Charles Kiesling ..	M.	55	Feb. 17	Patella, comp. com.	Comminuted	1 inch separation; great swelling	Fell striking patella on a stone step

SIMPLE FRACTURES

T. D.....	M	18	Nov. 3	Tibia	Middle	.....	.....
Johanna Ward	F.	20	Jan. 26	"	2 in. above malleolus	.....	Slipped on the ground
Min. Haddon.....	F.	27	Feb. 10	"	2 in. above malleolus	.....	Slipped on ground
John Guyton.....	M.	29	Mar. 22	"	6 in. below patella	Oblique	Crushed by case of goods 900 lbs.
John Burke.....	M.	29	Mar. 23	"	Middle	Oblique	Slipped on ground
Catharine Corlan..	F.	30	Feb. 12	"	5 in. above malleolus	.....	Slipped on ground
Th. Dempsey.....	M.	35	June 2	"	4 in. above malleolus	Oblique; some shortening; considerable swelling	Fall 5 feet
Agn. Jarvis.....	F.	42	Dec. 31	"	Junc. middle & lower third	None	Fall on ice
M. K.....	F.	50	May 24	"	3 in below patella	.....	.....
P. M.....	M.	54	May 28	"	5 in. below patella	.....	.....

OF PATELLA.

Splints. Applied. 1st.	Splints. Applied. 2d.	Splints. Applied. 3d.	Splints. Removed. 1st.	Splints. Removed. 2d.	Splints. Removed. 3d.	No. splints.	Result.	Anæsthetic.	Remarks.
July 12 4th day	.....	.....	Aug. 26 44 days	.....	.....	1	¼ inch separation; union good	.....	Adhesive plaster strips were used for first 4 days, but they did not answer at all.
Oct. 1 8th day	.....	.....	Jan. 1 90 days	.....	.....	1	Moderate motion (separation not recorded)		
Jan. 26 same day	Feb. 6 (starch) 10th d'y	Feb. 13 17th d'y No. 4, Feb. 25 29th d'y No. 5, Mar. 10 44th d'y	Sept. 6 10 days	Feb. 13 7 days	Feb. 36 12 days No. 4, Mar. 10 15 days No. 5, May 3 53 days	5	¼ inch separation; firm ligamentous union	.....	The apposition of the fragments was found to be perfect every time the splints were removed, except the last.
Feb. 12 4th day	Feb. 25 17th d'y	.....	Feb. 25 17 days	Feb. 26 1 day	.....	2	⅛ inch separation; knee rather stiff	.....	It is not stated why last splint was removed so soon.
Dec. 27 3d day	Jan. 7 13th d'y	.....	Jan. 5 8 days	Feb. 10 35 days	.....	2	¼ inch separation; good union		
Dec. 22 3d day	.....	.....	Feb. 4 40 days	.....	.....	1	⅜ inch separation		

OF PATELLA.

Feb. 25 8th day	.....	.....	Feb. 31 6 days	.....	.....	1	No separation; good union and motion	.....	Application of the splint was delayed by swelling.

OF TIBIA.

.....	Jan. 15	.....	Jan. 15	Feb. 1 15 days	.....	2	Perfect		
Jan. 26 immed.	Feb. 22 26th d'y	.....	Feb. 9 cut up. Feb. 22 rem'v'd	Mar. 5 11 days	.....	2	Perfect		
Feb. 11 n'xt d'y	.....	.....	Mar. 23 42 days	.....	.....	1	Right		
Mar. 23 n'xt d'y	April 26 33d day	April 28 (silicate soda) 35th d'y No. 4, May 28 65th d'y	April 26 33 days	April 28 (did not fit) 2 days	May 24 26 days	4	Union not firm	.....	The patient was discharged with the 4th splint on. Silicate soda was used in 3d splint, as plaster was uncomfortable.
Mar. 26 (silicate soda) 3d day	April 2 10th d'y	.....	Mar. 29 cut, it is tight. April 2 10 days rem'v'd	April 25 23 days	.....	2	Union and position good. Some temporary paralysis of extensors of foot		
Feb. 13 n'xt d'y	April 1 48th d'y	.....	April 1 48 days	April 4 3 days	.....	2	Good union		
June 4 2d day	.....	.....	July 11 37 days	.....	.....	1	Union and position good		
Jan. 1 n'xt d'y	Feb. 15 45th d'y	.....	Feb. 15 45 days	Mar. 24 39 days	.....	2	Union and position good		
June 20 26th d'y	.....	.....	July 20 30 days	.....	.....	1	Fibrous union; position good	.....	This patient came into hospital several weeks after injury. The splint was put on to enable her to go about ward.
May 28 immed.	.....	.....	No record	.....	.....	1	Perfect		

SIMPLE FRACTURES

Name.	Sex.	Age.	Date.	Bone.	Point.	Shortening, deformity, etc.	Cause of injury.
John Flemming...	M.	75	Jan. 29	Tibia	Junction of middle and upper third	Bows out	Horse stepped on his leg
J. I.....	M.	No record	Nov. 4	Tibia double frac.	1.3 in. below patella 2.7 in. below patella	.....	Fall

COMPOUND FRACTURES

Herbert Putnam (see Fr. of Femur.)	M.	19	July 4	Tibia comp. commin. Femur simple	Lower and middle third; Lower part middle third	.....	Railroad accident
J. H.....	M.	22	Aug. 27	Tibia comp.	Middle third	Very oblique	.....
M. K.....	F.	34	May 11	Tibia comp	2 inches above malleolus	.....	.....

SIMPLE FRACTURES

J. Collins.....	M.	25	Mar. 30	Fibula and inter. lat. lig.	Potts' fracture	Potts'	Slipped on ground
P. McN.	M.	26	Dec. 23	"	" " "	"	.....
B. Scanlon.....	F.	36	Oct. 21	"	" " "	"	Fall
J. B.....	M.	45	May 1	"	" " "	"	.....
S. Cullan.....	F.	65	Feb. 4	"	" " "	"	Fall on ice
G. H.....	M.	50	Oct. 31	"	" " "	"	Fall

COMPOUND FRACTURES

Rosanna Carney...	F.	32	Nov. 23	Fibula comp'd	Potts' fracture	Potts'	Fall down stairs
B. G.....	F.	55	May 15	Fibula comp'd	" "	"	.....

SIMPLE FRACTURES

Charles Holroper..	M.	30	Nov. 24	Fibula	3 inches above malleolus	.....	Fall
Pat. McDonald....	M.	35	Feb. 21	"	2½ in. above malleolus	.....	.....
A. K.....	F.	..	Sept. 25	"	External malleolus	.....	.....

SIMPLE FRACTURES

Jos. Wener.....	M.	16	Oct. 21	Tibia and fibula	Junction mid. and lower third	Transverse fracture	Fall 10 feet
E. D.....	M.	25	Feb. 16	"	Lower third	.....	.....

OF TIBIA.—Continued.

Splints. Applied. 1st.	Splints. Applied. 2d.	Splints. Applied. 3d.	Splints. Removed. 1st.	Splints. Removed. 2d.	Splints. Removed. 3d.	No. splints.	Result.	Anæsthetic.	Remarks.
Feb. 7 8th day	Feb. 14 15th d'y	Mar. 24 55th d'y	Feb. 14 7 days	Mar. 13 29 days	Mar. 29 5 days	3	Position good; union not very firm	.....	It is not recorded what was used between March 13, and March 24, when patient seems to have been without splints.
Nov. 12 8th day	.....	.....	Dec. 17 35 days	.....	.....	1	Union and position perfect		

OF TIBIA.

July 4 in 5½ h.	July 6 2d day	July 17 13th d'y	July 6 2 days	July 17 11 days	Aug. 21 34 days	3	¼ inch longer; union & position perfect	Ether twice	This patient walked from the battery to Cent'l Park in latter part of September. He was of good family, healthy, and plucky.
July 5 n'xt d'y	July last		July last past	Aug. 21		2			
Sept. 2 5th day	Sept. 15 18th d'y	Sept. 18 21st d'y	Sept. 15 13 days	Sept. 18 3 days	No record	3	Union & position perfect; joint a little stiff	None	The splints were changed as they became soaked with the discharges.
May 11 immed.	.....	.....	No record	.....	.....	1	Perfect		

(POTTS') AND OF FIBULA.

April 1 n'xt d'y	.....	.....	May 9 39 days	.....	.....	1	Union & position perfect	None	
No record	.....	.....	Jan. 22 29 days	.....	.....	1	Perfect	None	
Oct. 28 7th day	.....	.....	Patient ran away on pass	.....	.....	1	.. ..	.....	This patient ran away with the splints on.
May 1 immed.	.....	.....	No record	.....	.....	1	All right		
Feb. 5 n'xt d'y	.....	.....	Mar 26 21 days	.....	.....	1	Cured		
Nov. 9 9th day	.....	.....	Dec. 14 35 days	.....	.....	1	Union & position perfect		

(POTTS').

Dec. 7 14th d'y	Dec. 14 21st day	Jan. 3 39th d'y	Dec. 14 7 days.	Jan. 3 19 days	Feb. 8 35 days	3	Union & position good	.....	Patient did not come to hospital until two weeks after accident.
May 15 immed.	June 1 15th d'y	.....	June 1 15 days	June 30 15 days	.....	2	Perfect	Ether	

OF FIBULA.

Nov. 26 2d day	Dec. 9 15th d'y	.....	Dec. 9 13 days	Jan. 6 27 days	.....	2	Firm union		
Feb. 25 4th day	.....	.....	May 31 36 days	.....	.....	1	Perfect		
.....	.....	.....	Nov. 5 40 days	.....	.....	1	Good		

OF BOTH TIBIA AND FIBULA.

Oct. 29 8th day	.....	.....	Nov. 30 31 days	.....	.....	1	Cured		
Feb. 18 2d day	Mar. 5 17th d'y	.....	Mar. 5 16 days	Mar. 24 19 days	.....	2	Union and position perfect		

SIMPLE FRACTURES

Name.	Sex.	Age.	Date.	Bone.	Point.	Shortening, deformity, etc.	Cause of injury.
Wm. Coogan.....	M	26	Mar. 26	Tibia and fibula	Near middle	Oblique	Jumping from a wagon he fell
Geo'a Hays.....	F.	28	Feb. 21	" "	Near middle	.....	Slipped on ground
F. McNamara.....	F.	29	Jan. 13	" "	3½ in. above malleolus	Swollen	Slipped and fell on ice
Peter Dempsey....	M.	30	June 8	" "	Upper third	Swollen	Struck by a "jack" which slipped in raising a ship
W. S.....	M.	30	Nov. 19	" "	Middle third	.....	.....
J. Mahoney.....	M.	30	Feb. 22	" "	.....	Oblique	Slipped on ground
N. T.....	M.	38	Dec. 8	" "	.....	.....	Fall
W. S.....	M.	40	Nov. 14	" "	Junct'n lower and middle third	.....	.....
J. H.....	....	42	April 27	" "	.....	.....	Direct violence
J. O'Brien	M.	42	June 15	" "	.....	.....	.....
Jas. Crogan.....	M.	45	Aug. 31	" "	Junct'n lower and middle third	Badly swollen	Fall 10 feet
J. Thompson.....	M.	45	Feb. 19	" "	.....	Oblique	Slipped on ground
A. G.....	F	50	June 4	" "	2 in. above malleolus; ½ in. above malleolus	Great deformity	.....
C. F.....	F.	55	Nov. 28	" "	.....	.....	.....

COMPLICATED FRACTURES (not compound)

Joseph Keller.....	M.	21	April 2	Triple frac. tibia and fibula	1. Near malleoli 2. Middle shaft 3. Upper third	Short 1½ inch	.....
Henry Shiner	M.	23	Feb. 27	Double com. fracture, tibia comm fibula comm.	3 & 8 in. above malleolus 3 & 8 in. above malleolus	Swollen and inverted	Slipped on ground
P. K.....	M	24	Dec. 30	Comm. of fibula, tibia and fibula com.	.....	.....	.....

OF BOTH TIBIA AND FIBULA.—Continued.

Splints. Applied. 1st.	Applied. 2d.	Applied. 3d.	Removed. 1st.	Removed. 2d.	Removed. 3d.	No. splints.	Result.	Anæsthetic.	Remarks.
Mar. 26 at once	April 3 silic. soda 7th day	.....	Mar. 29 3 days, tight	May 6 37 days	.....	2	Union good, but slight deformity	.....	Pain ceased when the plaster splint was cut. This case was treated with silicate soda, the splint being braced ant. and post. with iron strips.
Feb. 22 n'xt d'y	.....	.....	April 5 33 days	.....	.....	1	Cured		
Jan. 14 n'xt d'y	Jan. 21 8th day	.....	Jan. 21 7 days, loose	Feb. 26 36 days	.....	2	Union and position perfect		
June 12 4th day	July 13 35th d'y	.....	July 13 31 days	No record	.....	2	Union and position perfect		
Nov. 20 n'xt d'y	Dec. 4 15th d'y	Jan. 3 44th d'y	Dec. 4 14 days, loose	Jan. 3 29 days union not firm	Jan. 20 17 days	3	Union and position perfect	Ether 1st time	The patient is suffering from tertiary syphilis.
Feb. 22 immed'y	.....	.....	April 14 50 days	.....	.....	1	No record		
Dec. 8 same day	.....	.....	Jan. 10 32 days	.....	.....	1	Union and position perfect	.....	Dec. 9, in delirium tremens patient walked about the ward on his splint unsecured; neither the leg nor splint were injured.
Nov. 14 same day	Dec. 27 43d day	.....	Dec. 27 43 days, union not firm	Jan. 31 34 days	.....	2	Union and position perfect	Ether to reduce fract. 1st time.	
Immediately	.....	.....	No record	.....	.....	1	Union and position perfect		
June 15 same day	June 24 9th day, to see that all is right	.....	June 24 9 days	No record	.....	2	Union and position perfect		
Sept. 4 (starch) 4th day	Oct. 8 38th d'y	.....	Oct. 8 34 days	No record	.....	stch plas 1	Some deformity after the starch; no record of plaster		
Immediately	.....	.....	No record	.....	.....	1	⅝ inch shortening		
Immediately	.....	.....	July 8 34 days	.....	.....	1	Some deformity	Ether	
Nov. 28, same day	.....	.....	Jan. 15 47 days	.....	.....	1	Union and position perfect		

OF BOTH TIBIA AND FIBULA.

Immediately	April 8 6th day	.....	Cut down to relieve swel'ng of foot April 2, remov'd April 8, 6 days	May 13 35 days	.....	2	Union, length, and position perfect	Ether 2d splint	When the first splint was removed there was 1 inch shortening. Ether and the comp'd pulleys were used the reduction made perfect, and 2d splint applied
Mar. 1 2d day	Mar. 11 12th d'y	.....	Mar. 11 9 days loose	April 4 23 days	.....	2	Union and position perfect		
Jan. 4 4th day	.....	.....	Feb. 20 46 days	.....	.....	1	Union and position perfect	Ether	

COMPLICATED FRACTURES (not compound)

Name.	Sex.	Age.	Date.	Bone.	Point.	Shortening, deformity, etc.	Cause of injury.
Charles Burns.....	M.	33	July 23	Tibia and fibula, femur	Middle Middle	.....	Run over by truck
John Van Thung...	M.	41	Nov. 2	Tibia com. fibula com.	.....	.....	A barrel of beer fell on the leg

COMPOUND FRACTURES

Benj. McMahon....	M.	8	Feb. 17	Both tibia comp. com. both fibula comp. com.	Junct'n lower and mid. third	.....	Run over by horse car
R. Jackson.....	M.	23	June 10	Tibia comp. and fibula comp.	Junct'n lower and mid. third	.....	Direct violence
P. Beck.....	M.	23	Oct. 28	Tibia and fibula comp.	Junct'n lower and mid. third	.....	A 1575 lb. roller passed over the limb
John Manning.....	M.	26	Sept. 10	Tibia comp. and fibula comp	Middle	.....	Run over by horse car
W. E.....	M.	28	April 25	Tibia and fibula comp	2 inches above malleolus	.....	.....
P. Stoll.....	M.	36	Sept. 23	Tibia and fibula comp.	Middle third	1 inch of bone removed; no swelling	Fall 20 feet
Ch. Keeney.....	M.	42	Mar. 20	Tibia and fibula comp.	Junct'n upper and mid. third	Lower fragment projects	.....

SIMPLE FRACTURES

Henry Coleman...	M.	12	Sept. 15	Humerus	.....	.....	Fell 6 stories
Ernest Klinck.....	M.	17	Mar. 1	"	Surg. neck	Considerable shortening	Fell 10 feet
C. S.....	M.	19	Aug. 12	"	Middle	.....	.....
J. F.....	M.	21	Nov. 23	"	Middle third		
(Same refractured.)			Jan. 23	"	Middle third	.....	Patient jerked his arm during passive motion
L. Allen.....	F.	23	Mar. 2	"	Junct. middle and lower third	Oblique displacement	Twisted by policeman
John Mahoney....	M.	28	Feb. 11	"	Surg. neck	.....	Fell one flight stairs
W. Dobersecker...	M.	58	Oct. 10	"	Surg. neck	No swelling, lower fragment displac'd inward	.....

OF BOTH TIBIA AND FIBULA.—Continued.

Splints. Applied. 1st.	Applied. 2d.	Applied. 3d.	Removed. 1st.	Removed. 2d.	Removed. 3d.	No. splints.	Result.	Anæsthetic.	Remarks.
July 24, A. M. n'xt d'y July 24, P. M.	July 25 2d day	Sept. 4 41st d'y (No. 4.) Oct. 3 71st d'y	July 25 2 days Sept. 4	Sept. 4 39 days	Oct. 3 30 days (No. 4.) No record	4 1	Union not very firm; allowed to go out with a splint on	.....	The second leg splint was applied because extension was made from the first and pressure was feared. (See same under Fractures of Os Femoris.)
Nov. 5 3d day	Dec. 18 46th d'y	Feb. 13 91st d'y union not firm	Dec. 18 43 days union not firm	Feb 13 55 days	March 1 17 days	3	Union firm	Ether	Patient was a great drinker.

OF BOTH TIBIA AND FIBULA.

Right Feb. 20 left 3d day	Left Mar. 15 28th d'y old one looks badly	.....	Right, April 15 56 days, left Mar. 15 25 days	..... Left, April 15 31 days	.....	r'ht 1 left 2	Slight overlapping of fragments; left perfect, but some necrosis	None	Patient almost died of hemorrhage before admission. It was intended to amputate both legs, but he was too weak.
June 11 2d day	.....	.....	No record	.....	.....	1	Union and position perfect	.....	This patient, contrary to orders, left his ward at night and slept in a tent with a case of pyæmia; erysip. migrans set in, and he died in about two or three weeks.
Oct. 26 in 12 h's	Dec. 14 46th d'y	.....	Dec. 14 46 days	Dec. 28 14 days	.....	2	Firm union; some necrosis	Chlo-rof'm 1st sp.	Patient had a severe septicæmia, but recovered.
Sept. 11 2d day	Sept 23 13th d'y 1st loose	Nov. 24 45th d'y only 1 fenestra	Sept. 23 13 days	Nov. 24 32 days	Jan. 15 51 days	3	Union and position perfect; some necrosis	None	It was at first intended to amputate, but afterwards it was concluded to try plaster first.
Apr. 26 2d day	No record	.....	No record	No record	.....	2	Perfect		
immediately	.....	.....	No record	.....	.....	1	Cured	.....	The wound was sealed with lint and collodion.
Mar. 26 6th day	.....	.....	May 10 44 days	.....	.....	1			

OF HUMERUS.

Sept. 16 2d day	.....	.....	Oct 25 39 days	.....	.....	1	Union good	.....	I find this boy also had fractured radius and ulna of opposite side.
March 1 same day	.....	.....	Mar. 31 31 days	.....	.....	1	No marked deformity, union good		
Aug 15 3d day	.....	.....	Sept. 8 24 days	.....	.....	1	No deformity, union good		
Nov. 28 5th day	Dec. 16 23d day	.....	Dec. 16 18 days	Jan. 18 32 days	.....	2	Union and position good	.....	He pulled his arm very forcibly back during passive motion and snapped the bone in about the same place.
Jan. 24 2d day			Feb. 28 34 days			1	Union and position good		
March 3 2d day	.....	.....	Mar. 26 23 days	.....	.....	1	Firm union		
Feb. 14 3d day, gutta percha	Mar. 17 35th d'y plaster	.....	Mar. 17 32 days	Mar. 24 7 days	.....	2	Good union and motion, slight projection of upper fragment		
Oct. 10 1st day	.....	.....	Nov. 16 36 days	.....	.....	1	Good union	.....	Patient has had pneumonia while under treatment for the fracture.

COMMINUTED FRACTURES

Name.	Sex.	Age.	Date.	Bone.	Point.	Shortening, deformity, etc.	Cause of injury.
Dennis Lyon.....	M.	11	June 2	Humerus comminut'd	Through the condyles, which are comminuted	.....	Fell on side-walk
Al. McArthur.....	M.	35	Sept. 30	Humerus comminut'd	Junct upper and middle third	.....	Fell on side-walk

COMPOUND FRACTURES

Hugo Listz.....	M.	11	July 24	Humerus compound, radius and ulna comp.	Both condyles head; 2 inches below joint	.....	Elbow caught in iron doors

COMPLICATED FRACTURES

Daniel ——.....	M.	7	Sept. 14	Humerus; radius dislocated backward	External condyle	.....	.....
Alice Delaney.....	F.	17	June 15	Humerus; femur	Middle third; middle third	.....	Struck by rocks from a distant blast
S. U. Clerk.....	M.	18	Jan. 21	Humerus; femur	Just above condyles; middle third	Oblique "	Fall 33 feet
M. C.....	M.	45	June 22	Humerus; ulna	Internal condyle; 1. Olecranon; 2. 1½ inch bel. coronoid process	.....	.....

FRACTURES

Not treated with plaster dressing.

Thos. Dumphy	M.	23	Jan. 13	Ulna	Upper third	Upper fragm't drawn forw'rd and upward	Fall on ground
Jer. O'Brien..	M.	27	April 28	"	Olecranon	.....	Fight
M. C.....	M.	45	June 22	"	1. Olecranon 2½ inch bel. joint;	.....	.....
				Humerus	Internal condyle		

FRACTURES OF BOTH

Hugo Listz	M.	11	July 24	Radius com. ulna com. humerus com.	Head; 2 inches below joint; both condyles	.....	.....
Daniel Dillon.	M.	32	June 11	Radius comm. ulna compound.	Lower third; olecranon	Drawn up	Fell 50 feet

OF HUMERUS.

Splints. Applied. 1st.	2d.	3d.	Removed. 1st.	2d.	3d.	No. splints.	Result.	Anæsthetic.	Remarks.
June 12 10th d'y	.....	.....	June 24 12 days	.....	.....	1	Very slight anchylosis		
Oct. 5 6th day	.....	.....	Nov. 8 33 days	.....	.....	1	Union firm		

OF HUMERUS.

Immediately	Aug. 9 16th d'y	.....	Aug. 9 16 days	Oct. 24 75 days	.....	2	Good union; slight motion only	.....	He finally had motion through about 30 degrees. The joint was opened by the accident.

OF HUMERUS.

Sept 14 1st day	.....	.....	Oct. 1 17 days	.....	.....	1	Union and position good; some little stiffness at joint	.....	Passive motion was being used, but the boy ran away.
June 18 3d day	July 7 22d day	.....	July 15 27 days	July 25 18 days	.....	1	Perfect; ¼ inch shortening,	Ether both times	
June 17 2d day			July 7 20 days			2	union and position perfect		
Jan. 24 4th day	Feb. 5 14th d'y	.....	Jan. 28 4 days	Feb. 27 22 days	.....	2	Union and position good; ⅔ in.	Ether	
"			Mar. 11 46 days			1	shortening		
July 1 9th day	.....	.....	July 20 20 days	.....	.....	1	Union and position good;		
"			"			same splint	1. Fibrinous un. 2. Union and position good		

OF ULNA.

Jan. 20 7th day	.....	.....	March 6 44 days	.....	.....	1	Union and position perfect	Ether	Patient did not come to hospital until one week after injury.
April 28 1st day	.....	.....	May 17 19 days	.....	.....	1	Good apposition; union not firm	.....	Complicated by fracture of leg, the result of which is not recorded.
July 1 9th day	.....	.....	July 20 19 days	.....	.....	1	1. Fibrinous union 2. Good union and position		
"			"				Good union and position		

RADIUS AND ULNA.

Immediately	Aug. 9 15th d'y	.....	Aug. 9 15 days	Oct. 30 52 days	.....	2	Union and position good; some stiffness at elbow	.....	Motion through about 30 degrees.
"	"		"	"					
June 11 1st day	.....	.....	July 18 37 days	.....	.....	1	Union firm; motion not perfect	.....	Arm moves through about 90 degrees.

SIMPLE FRACTURES

Name.	Sex.	Age.	Date.	Bone.	Point.	Shortening, deformity, etc.	Cause of injury.
M. James.....	M.	40	Oct. 10	Os calcis	.....	.....	Fell 30 feet
C. Driscol.....	F.	50	Oct. 12	Os calcis	.....	.....	Fell 4 feet

SIMPLE FRACTURES

L. McCartby	M.	27	May 2	Meta-carpals, comp. com.	.....	.....	Nitro-glycerine explosion
L. Curry.....	M.	61	July 3	4 metatar-sals, comp.	.....	.....	.....

RUPTURE

H. Ward.....	M.	29	Oct. 3	Internal lat. ligaments of both knees	.....	.....	Caught on a shaft & carried between it and the wall
D. Callan.....	F.	57	Oct. 30	External lat ligam'ts, knee	.....	Dislocation of leg backward	Run over

SIMPLE FRACTURES

Charles O'Brien...	M.	33	April 19	9th rib	2 inches from cartilage	.....	Case of goods fell on him

AVERAGES.

FRACTURES OF FEMUR.

RESULTS.

Lengthening	⅛ inch, No. 1.	
No shortening	" 4.	
Shortening of	⅛ " " 4.	
Shortening "	¼ " " 5.	
Shortening "	½ " " 7.	
Shortening "	⅝ " " 1.	
Shortening "	¾ " " 5.	Good reason for poor result in some of these cases.
Shortening "	1 " " 1.	No attempt to get full length.
Shortening "	1⅛ " " 1.	Had bad delirium tremens.
Shortening "	1½ " " 9.	In bed with pneumonia. The worst results of plaster of thigh are always in patients kept in bed.
Shortening "	2 " " 1.	In bed with subacute pleurisy. The worst results of plaster of thigh are always in patients kept in bed.
Ununited	.. .. " 1.	No good reason ever found.

OF OS CALCIS.

Splints. Applied. 1st.	2d.	3d.	Removed. 1st.	2d.	3d.	No. splints.	Result.	Anæsthetic.	Remarks.
Oct. 10 1st day	.....	.....	Nov. 10 30 days	.....	.....	1	Union good		
Oct. 12 1st day	.....	.....	Nov 13 31 days	.....	.....	1	Union good		

OF METACARPAL AND METATARSAL BONES.

May 14 12th d'y	.....	.....	June 5 21 days	.....	.....	1	Union not firm in first metacarpal; union firm in others	.....	Patient had also triple compound comminuted fracture of inferior maxilla.
July 11 7th day	.....	.....	July 29 18 days	.....	.....	1	Union firm		

OF LIGAMENTS.

Oct. 5 3d day	Not recorded	.....	Not recorded	Dec. 1 56 days	.....	2	Good union, but joints a little loose; ordered elastic knee caps.	.....	This shaft was revolving 120 times a minute; distance between shaft and wall 1 foot Up and around on crutches Oct. 8.
Oct. 31 2d day	Nov. 18 19th d'y	Nov. 29 30th d'y	Nov. 18 18 days	Nov. 29 11 days	Dec. 19 20 days	3	Position good		

OF RIBS.

April 20 2d day	.....	.....	May 3 13 days	.....	.....	1	Cured		

AVERAGES.

FRACTURES OF FEMUR.

RESULTS.

Lengthening	is	1 or $\frac{1}{30}$	about of all cases.		
Shortening none and less	are	5 " $\frac{1}{6}$	"	"	
Shortening of $\frac{1}{8}$ inch and less	are	9 " $\frac{1}{3}$	"	"	
Shortening " $\frac{1}{4}$ " "		14 " $\frac{1}{2}$	"	"	
Shortening " $\frac{1}{2}$ " "		21 " $\frac{2}{3}$	"	"	
Shortening " 1 " "		27 " $\frac{9}{10}$	"	"	
Shortening over 1 inch		3 " $\frac{1}{10}$	"	"	See cases for reasons.

AVERAGES.

Bone.	Age of patients.	Number cases.	Cause of injury.	Time from injury to the application of the splint—in days.	Time splint remained on in days.	Number splints.	Result.
Simple fractures femur	1–10	4	.....	6 1/4 days; but Buck's extension was on 1 case 15 days; without this case 3 days	33 days	1	Shortening 7/16 or — 1/2 in.
Simple fractures femur	10–20	3	.....	7 days; one on the 14th day; without this 3 + days	39 days	1 1/3	Shortening 7/24 or + 1/4 in.
Simple fractures femur	20–50	13	.....	4 8/10 days	34 7/10 days	1 3/13	Shortening 7/12 or + 1/2 in.; cases making this result so high were confined to bed, a position which gives the worst possible results in plaster dressing of thigh.
Simple fractures femur	50–75	6	.....	4 1/10 days; the case where splint was applied on 47th day is omitted as it was only put on that he might go about on crutches	38 1/2 days	1	Shortening 2 9/48 or about 5/8.
All simple fractures femur	1–75	26	.....	5 1/2 days; usual time 3d day	36 1/4 days	1 1/6	Shortening — 1/2 inch.
Compound and complicated fractures femur	.....	5	.....	3 days	53 4/5 days; 1 was on 90 d'ys, an unusual time.	1 3/5	Shortening 14/60 or 1/5 inch.
All fractures of femur	1–75	31	.....	4 1/4 days	45 days	1 2/5, or nearly half required a 2d splint	Average result:— Shortening 36/100 or little over 1/3 inch.
Simple fractures patella	19–36	6	Fall 3, musc con. 2, No record 1	3 days	55 1/3 days	2	Separation 1 1/18 or about 1/4 in. Good union bony 2. Firm " ligamentous 1. No record of union 3.
Adding one case of comp'd frac. we have all fracts. of patella	19–55	7	Fall 4, musc.con. 2, No record 1	5 1/2 days	This comp'd case carried a splint only 6 days; reason not giv'n	1 1/3	Separat'n 1 1/96 or ab't — 1/8 in. Good union bony 3. Firm union ligamentous 1. No record of union 3.
Simple fractures tibia	18–50	8	Slipped and fell on the ground 5, Direct violence 2, No record 1	—1 6/7 days	49 1/3 days; 5 weeks was the usual time allow'd for these cases	2	All right 7. Not firm 1.
Simple fractures tibia	50–75	4	.....	10 1/4 days; includes a case which came to hospital several weeks after injury; without this 4th day	35 1/3 days	1 1/2	All right 2. Union not firm 2. One of these poor cases is that sent to hospital several weeks after injury.
Compound and complicated fractures of tibia alone	19–34	3	.....	2d day	Poor record	2 1/3	All right 3 One was even 1/8 longer.
All fract'res of tibia	18–75	15	.....	4 1/3 days	42 1/2 days	2	All right 12. Not firm 3.

AVERAGES.

Bone.	Age of patients.	Number cases.		Time from injury to application of the splint—in days.	Time splint remained on in days.	Number splints.	Results.
Simple (Potts') fractures	25-65	6	.....	4th day	31 days	1	All right 5. Run away 1.
Compound (Potts') fractures	32-55	2	.....	7th day; one case did not come to hospital for 2 weeks after injury	45½ days	2¼	All right 2.
All Potts' fractures	25-65	8	.....	5½ days	38¼ days	1½+	All right 7. Run away 1.
Simple fractnres fibula	30-35	3	.....	3 days	38⅔ days	1⅓	All right 3.
Simple fractures both tibia and fibula	16-55 Bel'w 20 is 1 above 50 are 2	16	.....	$1\frac{13}{16}$ days	$43\frac{5}{11}$ days No record, 5 cases	$1\frac{9}{16}$ or 1½+	All right 11. Slight deformity 3. Shortening 1, of 5/8 inch. No record 1.
Complicated fractures both tibia and fibula	21-41	5	.....	$2\frac{1}{5}$ days	58½ days No record, 1 case	$2\frac{2}{3}$	All right 4. Union not firm 1.
Compound fractures both tibia and fibula	8-42 Bel'w 20 is 1	7 one of both legs is 8	.....	$2\frac{3}{16}$ days	$60\frac{2}{5}$ days No record, 3 cases	$1\frac{5}{8}$	All right 3. " except some necrosis 3. Slight overlapping 1. No record 1.
All fractures both tibia and fibula	8-55	28	.....	$2\frac{1}{16}$ days	$54\frac{1}{5}$ days	1¾+	All right 21. Slight deformity 4. Not firm 1. No record 2.
Total all varieties simple fractures leg	16-75	37	.....	3¼ + days	37⅔ days	1½—	All right 28. Not firm 3. Slight deformity 4. Ran away 1. No record 1.
Total all varieties compound and complicated fractures of leg	8-42	17	.....	$3\frac{3}{10}$ + days	$54\frac{5}{6}$ days	2	All right 14. Lengthened (1/8 inch) 1. Union not firm 1. No record 1.
Grand total, all fract'res of leg	8-75	54	.....	3½ days	46¼ days	1¾	All right 42. Lengthened 1. Not firm 4. Slight deformity 4. Ran away 1. No record 2.

AVERAGES.

Bone.	Age of patients.	Number cases.	Place of fracture.	Time from injury to application of the splint—in days.	Time splint remained on in days.	Number splints.	Result.
Simple fractures humerus	12–58	7 one twice 8	Surg. neck 3 Shaft 4 No record 1	2⅜ days	34½ days	1¼	All right 7. Slight deformity 1.
Both compound and comminu'ed fractures humerus	11–35	3	Condyles 2 Shaft 1	5 days	45⅓ days	1⅓	All right 1. Slight motion 1. Slight stiffness 1.
Complicated fractures humerus	7—45	4	Condyles 2 Shaft 2	4¼ days	22½ days	1¼+	All right 3. Slight stiffuess 1.
All fractures humerus	7–58	15	Surg. neck 3 Shaft 7 Condyles 4 No record 1	4 days	34¼ days	1¼	All right 11. Slight deformity 1. Slight stiffness joint 2. Slight motiou joint 1.
Fractures ulna	23–45	3 or one do'ble 4	Olecranon 2 Shaft 2	5⅔ days	27⅓ days	1	All right 2. Fibrous union 2.
Fractures both radius and ulna	11–32	2	Elbow-joint involved 2	½ day	52 days	1½	Union and position good in both; but motion not perfect.
Fractures os calcis	40–50	2	.....	1 day	30½ days	1	All right 2.

When union is not PERFECTLY firm, it is recorded as "not firm."

The least *appreciable* deformity is recorded as "deformity."